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Afrotherian Conservation is published once a year by the IUCN Species Survival Commission Afrotheria Specialist Group to promote the exchange of news and information on the conservation of, and applied research into, golden moles, sengis, hyraxes, tenrecs and the aardvark.

Message from the Chair

Galen Rathbun
Chair, IUCN/SSC Afrotheria Specialist Group

In May this year we were all saddened and shocked by the senseless death of Hezy Shoshani by terrorists in Eritrea. Hezy was a member of our specialist group with expertise on the Paenugulata, which of course includes the hyraxes. His cheerful enthusiasm and willingness to participate in our activities will be missed.

This year has seen two new species of sengi described. In addition to the grey-faced sengi (*Rhynchocyon udzungwensis*) reported in our last newsletter, Dr Hannaline Smit, a successful Ph.D. student of Professor Terry Robinson, who is a member of our specialist group, has just described a new species, the karoo rock sengi (*Elephantulus pilicaudus*) from the Northern Cape and Western Cape provinces of South Africa. Publication citations for both of these new species can be found in the bibliography in this newsletter. You can also check out the discovery on our web page (go to the "sengis", then "new species").

Our website is now largely complete with the addition of tenrec material, which can be found by clicking the tenrec image on the home page. I have also updated several other sections as a result of the new sengis, as well as the newly released 2008 IUCN Red List, which the group participated in updating.

PJ Stephenson and I also assembled a Powerpoint presentation for the World Conservation Congress, held in October this year in Barcelona. We have posted a PDF version on the newsletter page of our web site.

As the IUCN quadrennial comes to a close at the end of 2008, this will be the last issue of our newsletter before the Species Survival Commission (SSC) dissolves our membership in preparation for, hopefully, reconstituting it for the next four years. As always, it is not clear who will be selected as the group's Chair, but it will be up to that person to assemble the membership.

Speaking of the SSC, thank you all for your feedback on the SSC proposal to reorganize the specialist groups. As you know, I sent a letter to the Chair of the SSC that reflected your concerns. There has been little news on this topic, other than that the proposal apparently was withdrawn pending further evaluation. At the Barcelona Congress Simon Stuart was elected as the new Chair of the Species Survival Commission, replacing Holly Dublin. This change will probably impact the proposed reorganization. Stay tuned…..

For those of you who have taken an active role in our activities over the last four years, many thanks! We now must all wait and see how 2009 unfolds!

G.B. Rathbun
Cambria, California. 1 December 2008

INSIDE THIS ISSUE

Article:

The black-and-rufous sengi (*Rhynchocyon petersi*): Distribution, relative abundance, and conservation on Zanzibar

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Introduction

Sengis, or elephant-shrews, are small terrestrial mammals in the order Macroscelidea whose geographic distribution is limited to the African continent. Although sengi classification and phylogeny have been reasonably well addressed in recent publications (cf. Seiffert 2007, Tabuce *et al.* 2008), the ecology and conservation status of many species remain poorly known (Nicoll and Rathbun 1990).

Black-and-rufous sengis (*Rhychocyon petersi*) are colourful 500g mammals (Fig. 1) that spend most of their time on the forest floor foraging for invertebrates. Although they are highly cursorial, they spend the night in leaf nests that they build on the forest floor. Because this species occupies fragmented, and often small, forests along the coast and in the Eastern Arc Mountains of Kenya and Tanzania (Nicoll and Rathbun 1990), it is considered Vulnerable by IUCN (Rathbun and Butynski 2008). In the Zanzibar archipelago, *R. petersi* is reported to occur on Unguja Island (also known as Zanzibar) and Mafia Island, but not on Pemba Island (Pakenham 1984).

Figure 1: Camera trap image of black-and-rufous sengi (*Rhynchoncyon petersi*) within the proposed Jozani-Kiwengwa Regeneration Corridor. Note continuous layer of leaf litter, despite rather open canopy and grassy opening in background.

Estimates of *R. petersi* densities in the Eastern Arc Mountains, based on nest surveys along line transects, yielded values ranging from 19.0 individuals/km² at Chome Forest Reserve (Coster and Ribble 2005) to as high as 79.3 individuals/km² across several smaller, more pristine sites (Hanna and Anderson 1994). Although habitat differences were not ruled out in explaining this variation, Coster and Ribble (2005) imply that human activity (e.g. timber harvesting and hunting) within Chome Forest might play a role in limiting population abundance. Therefore, we examined the distribution and relative abundance of *R. petersi* on Zanzibar in relation to indices of human disturbance that included signs of hunting and tree cutting.

Data on the relationship between habitat variables and *R. petersi* distribution and abundance are not widely available. Within the Chome Forest Reserve, *R. petersi* appears to prefer nesting sites with higher shade classes (a measure of canopy cover) where canopy heights are less than or equal to 5 m (Coster and Ribble 2005), suggesting ties to the availability of leaf litter for nesting and foraging opportunities, and cover for predator avoidance. If there is a direct relationship between canopy cover and the density or basal area of stems, then we would expect a positive correlation between these habitat variables and *R. petersi* abundance. Hence, we also report data on stem density and basal area and their relationship to relative abundances of the sengi.

Study Area

Data were collected at three field sites with two distinct habitat types (Fig. 2): the ground-water forests and coral rag forests of Jozani-Chwaka Bay National Park (JCBNP), the coral rag forests of the Kiwengwa-Pongwe Forest Reserve and the coral rag forests of Uzi Island, adjacent to mangroves. Jozani, located 35 km southeast of Zanzibar town on an isthmus between Chwaka Bay to the north and Uzi Channel to the south is Zanzibar's first and only national park. It covers approximately 5,000 ha, which includes high (20-30 m) evergreen plantation forest, ground-water forest, coral rag forest, mangrove forest, grasslands, scrub and salt marsh (Silkiluwasha 1981). Kiwengwa lies to the north of Jozani and is predominantly a coral rag forest with a maximum canopy height of 30 m (Silkiluwasha 1981). The 3,322 ha reserve has the second largest area of high coral rag forest after Jozani. Although recently upgraded to a forest reserve, illegal human activities such as the cutting of building poles and firewood, charcoal production and hunting still occur in the reserve. Uzi Island lies along the Uzi Channel, south of the Jozani Forest and is connected to Unguja (Zanzibar's main island) by a narrow isthmus of tidal mangrove swamp (Struhsaker and Siex 1998). Uzi Island consists mainly of agricultural lands, secondary forest, and grassland, with a maximum canopy height in the forest of 15 m (Silkiluwasha 1981); however, small remnant patches of high coral rag forest can be found along the island's western edge. Unfortunately, due to the lack of any protected status, the remaining forest patches on Uzi are severely degraded and quickly disappearing.

Materials and Methods

We visually sampled the relative abundance and distribution of *R. petersi*, as well as signs of human disturbance, along permanent transects on a monthly basis from May 2004 to December 2007 at Jozani, and every other month at Kiwengwa (from December 2004) and Uzi Island (from November 2005). The four transects at Jozani covered ground-water forest and coral rag forest, whereas the four transects in Kiwengwa and the two on Uzi only covered coral rag forest, although the Uzi transects were in very small patches of coral rag forest bordered by mangroves. The four transects in JCBNP range in length from 2,575 m to 3,225 m. The four transects in Kiwengwa range from 1,250 m to 3,850 m and the two transects on Uzi range from 1,850 m to 2,050 m (Nowak 2007)

Along each transect vegetative data were collected from 5 x 50 m plots at fixed intervals following Siex (2003). Plots were placed every 100 m at Jozani (Siex 2003) and every 200 m at Kiwengwa and Uzi (Nowak 2007). Within each plot, all woody stems ≥ 2.5 m in height were identified, tallied and measured for diameter at breast height (dbh) or diameter above buttresses (dab). From these data, we calculated stem density (stems/ha) and basal area (m²/ha) for each transect at the three field sites. Vegetative data for Kiwengwa and Uzi are from Nowak (2007), but reanalyzed for this paper.

Each transect was walked between 7 and 11 am by a pair of observers at a pace of 1 km per hour. All visual sightings of *R. petersi* and all signs of human disturbances (both visual and auditory) were recorded along all transects (no correction for visibility bias due to vegetation was included). We characterized human disturbance in two categories: destructive and non-destructive. Destructive activities included cutting vegetation for building poles, firewood and charcoal production, hunting and conversion to agriculture. Non-destructive activities included honey extraction and harvesting of *Phoenix reclinata* fronds for weaving, which have low impacts on habitats and are sustainable. Non-destructive activities probably had little or no impact on the distribution and abundance of *R. petersi*, thus we calculated an index of human disturbance based on the number of destructive human activities detected per km walked for each transect.

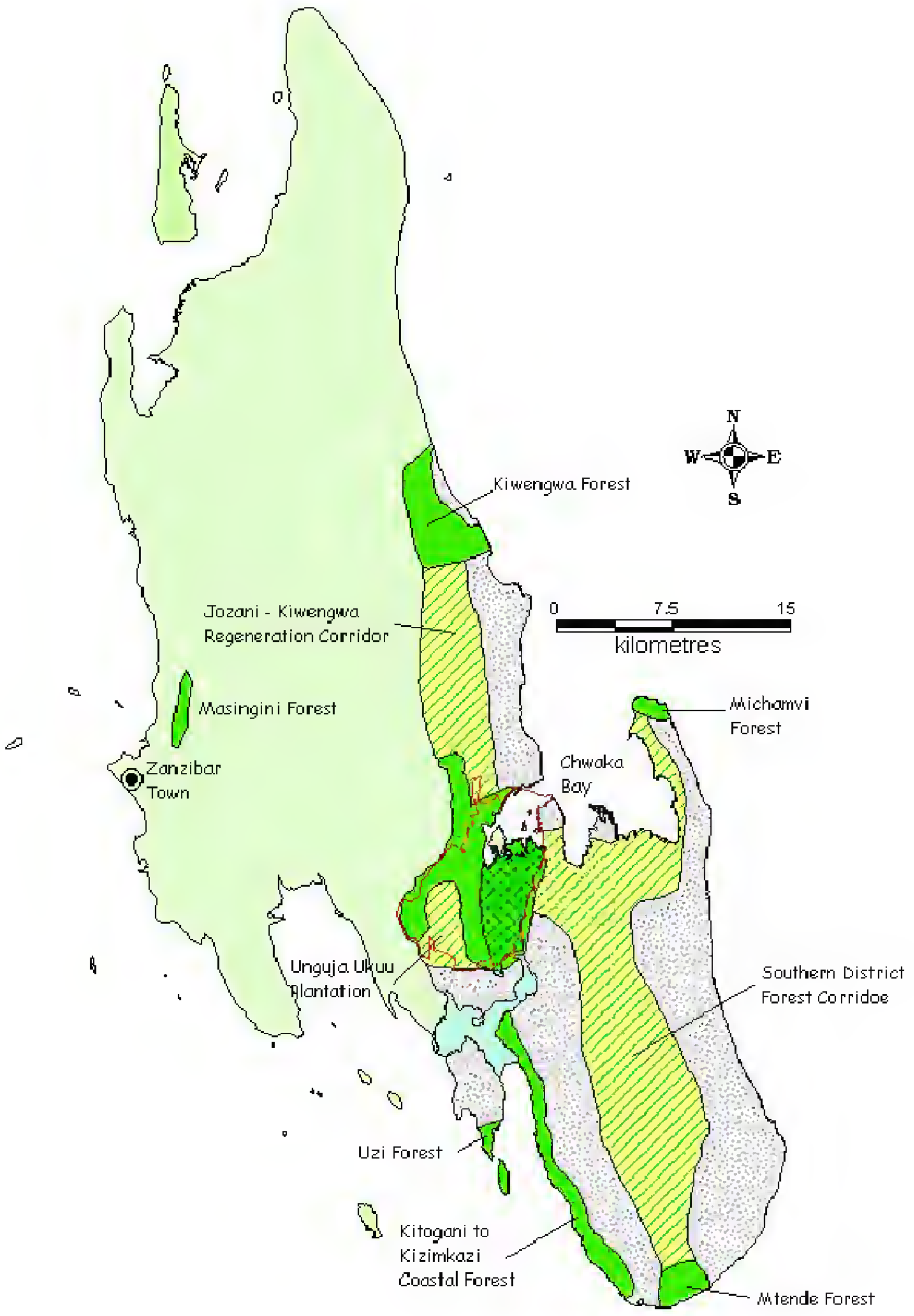

Figure 2: Map of Zanzibar showing study sites and major habitat types (modified from Masoud *et al.* 2003). Areas that are green or yellow with green cross-hatching support sengis, although it is unknown if they occur in Masingini Forest. The western half of the island shaded light green is not likely to support *R. petersi.*

We calculated an index of *R. petersi* abundance as the number of individuals seen per kilometre walked on each transect. Because no data were collected on nest density, we were unable to estimate *R. petersi* density as has been done in other studies (Hanna and Anderson 1994, Coster and Ribble 2005). Indices of relative abundance are sufficient for determining changing temporal trends in populations among and between sites.

We compared relative abundances of *R. petersi* between coral rag and ground-water forests using a non-parametric Mann-Whitney U test and performed correlation analyses to determine if there was any relationship between *R. petersi* abundance and human disturbance and habitat variables. We predicted a negative correlation between population abundance and measures of human disturbance, and a positive relation-ship between *R. petersi* abundance and stem density and basal area.

Results

By the end of the study period in December 2007, each transect in Jozani had been sampled at least 63 times for a total of 675 km surveyed. Of these, 370 km were in coral rag forest and 305 km were in ground-water forest. At Kiwengwa, each transect was sampled at least 20 times for a total of 216 km surveyed and on Uzi each transect was sampled at least 11 times for a total of 45 km surveyed.

We found significantly higher indices of abundance for *R. petersi* in coral rag forests than in ground-water forests (Mann-Whitney $U = 37$, $p = 0.016$, Table 1). In the ground-water forest, the indices ranged from 0 to 0.16 (individuals seen/km walked) with an average of 0.0675, whereas in the coral rag forests, they were 0.05 to 0.37 with an average of 0.212.

Across all transects in Jozani, Kiwengwa and Uzi, there was no relationship between the relative abundance of *R. petersi* and human disturbance or the habitat variables we examined. However, when data from coral rag forest transects were analyzed separately (i.e. data from ground-water forest transects were excluded) we found a significant positive correlation between human disturbance and stem density (Table 2). In addition, there was an inverse, but not significant, relationship between *R. petersi* abundance and human disturbance, with the lowest abundance indices being found on Uzi Island, the site with by far the highest levels of human disturbance (Table 1).

Discussion

We found *R. petersi* abundance to be significantly higher in coral rag forests than in the ground-water forest of Jozani, which confirms the earlier speculation of Nicoll and Rathbun (1990) that *R. petersi* is unlikely to occur at high abundance in ground-water forests because of the incompatibility of flooding with foraging and nesting habits.

We had predicted that *R. petersi* abundance would be negatively correlated with human disturbance and positively correlated with tree stem density and basal area. When data from both ground-water forest and coral rag forest were analyzed together we did not find any of the predicted relationships. However, when the data from the 10 coral rag forest transects were analyzed independently, we found a negative correlation between human disturbance and *R. petersi* abundance, although this correlation was not significant. In addition, there was a highly significant positive correlation between stem density and human disturbance. Given this observed relationship, we conclude that the potential predictive power of either human disturbance or vegetative variables to explain the variation in *R. petersi* relative abundance is confounded by this strong positive correlation between indices of human disturbance and stem density. In areas of high human destructive activities, the high coral rag forest is degraded and subsequently replaced by a lower stature coral rag thicket, which has a much higher density of stems but overall lower basal area.

Table 1: Indices of *R. petersi* abundance, human disturbance, and measures of stem density and basal area across two habitat types at three localities in Zanzibar. (JCBNP = Jozani-Chwaka Bay National Park, KPFR = Kiwengwa-Pongwe Forest Reserve & UZI = Uzi Island)

Location	Transect	Habitat type	*R petersi* Index (# seen/km walked)	Human Disturbance Index (# seen/km walked)	Stem Density (stems/ha)	Stem Basal Area (m^2/ha)
JCBNP	T1	coral rag forest	0.24	0.77	9216	20.73
JCBNP	T1	ground-water	0.02	0.04	2278	54.68
JCBNP	T2	coral rag forest	0.24	0.45	7511	31.47
JCBNP	T2	ground-water	0.09	0.01	3073	63.20
JCBNP	T3	coral rag forest	0.2	0.14	6916	26.24
JCBNP	T3	ground-water	0	0	4956	32.42
JCBNP	T4	coral rag forest	0.19	0.08	6958	28.39
JCBNP	T4	ground-water	0.16	0.01	3177	27.52
KPFR	K1	coral rag forest	0.3	1.52	11640	10.48
KPFR	K2	coral rag forest	0.37	1.63	12003	26.13
KPFR	K3	coral rag forest	0.17	1.33	11064	35.54
KPFR	K4	coral rag forest	0.24	1.25	11082	30.33
UZI	M	coral rag forest	0.05	4.18	14520	24.56
UZI	P	coral rag forest	0.12	2.07	11273	20.72

Table 2: Pearson correlation matrix for indices of *R. petersi* abundance, human disturbance, stem density and stem basal area in coral rag forests. This analysis excludes data from ground-water forest, thus n = 10, d.f. = 8, p = 0.05 when $r > 0.632$. There is a highly significant ($p < 0.01$) positive correlation between indices of human disturbance and measures of stem density and a negative, although not significant, relationship between indices of *R. petersi* abundance and human disturbance.

	R. petersi Abundance Index	Human Disturbance Index	Stem Density	Stem Basal Area
R. petersi Abundance Index	1			
Human Disturbance Index	*-0.484*	1		
Stem Density	-0.194	**0.92**	1	
Stem Basal Area	-0.169	-0.217	-0.254	1

The fact that we recorded *R. petersi* using coral rag forests that were heavily utilized and degraded by people, like those of Uzi, is very encouraging for the continued survival of this species on Zanzibar, where human pressure is increasing in all non-protected coral rag habitats. We also recorded sightings of this species in the mix of coral rag thickets, secondary bush and fallow shambas (perennial gardens) along the edge of Jozani, offering support to Nicoll and Rathbun's (1990) speculation that *R. petersi* can adapt to some modified or degraded habitats.

As half remaining coral rag habitats on Zanzibar are not in government protected areas, the long-term survival of *R. petersi* on Zanzibar will depend, in large part, upon its ability to adapt to modified habitats and our ability to conserve these areas on community lands. To this end, we are currently working with 16 communities from Kiwengwa in the north to Mtende Forest on the Southern tip of Zanzibar to monitor and manage their community forests (see Fig. 2 – these community forests are contained in the areas labelled as the Jozani- Kiwengwa Regeneration Corridor, Southern District Forest Corridor and the Kitogani-Kizimkazi Coastal Forest). During implementation of these 16 monitoring programmes, we have already recorded *R. petersi* as occurring across the community-managed forests. Although we do not yet have suff-icient data sets to determine *R. petersi* relative abundance in these community forest/shamba matrices relative to government protected areas, our preliminary findings are encouraging and show that this species is definitely flexible enough to utilize these areas. However, the western half of the island, due to its deep productive soils, supports much higher human population densities and all of Zanzibar's plantations (mainly coconut and other fruit trees) and is not likely to support *R. petersi*.

Finally, we are also currently undertaking a corridor analysis of Zanzibar Island based upon aerial photographs, reconnaissance surveys and camera trapping. We have concluded that all of the remaining government and community-managed forests from Kiwengwa to Mtemde are connected by habitat corridors. This allows movements of individuals and crucial genetic flow among the remaining populations of Zanzibar's fauna. A recent land cover analysis using aerial photographs from 2004 showed this matrix of government and community-managed coral forests, thickets, fallows and shambas covered 84,464 ha or 53% of the island of Unguja. Thus, despite Zanzibar's extremely high and expanding human population, currently at least half of the island is habitat that appears to be suitable for the black-and-rufous sengi.

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Article:

A golden mole (Family Chrysochloridae) from savanna woodland in the Batéké Plateau, Gabon

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Golden moles (Family Chrysochloridae) are currently thought to comprise 21 species in nine genera (Bronner and Jenkins 2005). All genera and most species are found in southern Africa, but three species from two genera (*Chrysochloris* and *Calcochloris*) are found in central and east Africa in Burundi, Cameroon, the Central African Republic, Democratic Republic of Congo (DRC), Gabon, Kenya, Republic of Congo Rwanda, Somalia, Tanzania and Uganda.

In mid-February 2005 a domestic cat, *Felis catus* L., 1758, brought back a golden mole, which was still alive (although it died soon after) to a field camp in the Batéké National Park in eastern Gabon just near the border with the Republic of Congo (approximately 2°S 14°E). The habitat in which it was captured was a savanna-woodland mosaic.

The golden mole was approximately 100 mm long. Its fur was dark grey and there was a distinct white stripe which began on each side of the muzzle and flared out as it extended along each side of the head (Fig. 1). The nose and feet were pink. This specimen was taken to the National Museums of Scotland for identification, but unfortunately by that time it had become very flattened and its condition had deteriorated. It was not possible to take external measurements for comparison. As much of the skin as possible was preserved and the remainder of the skeleton was prepared. Most of the skull had been crushed and the dentition, which would have aided identification considerably, did not survive. Comparison with skeletons of the large Kenyan *Chrysochloris stuhlmanni*, Matschie, 1894 in the Natural History Museum, London, suggested that this specimen belonged to another species found outside southern Africa, the Congo golden mole *Calcochloris leucorhinus* (Huet, 1885) (formerly *Chlorotalpa leucorhina*).

This identification was confirmed by detailed examination of the claws on the remaining right fore foot. The second and third claws are of similar length in *C. leucorhinus*, but the second is significantly shorter than the third claw in *C. stuhlmanni*. The shapes of the other long bones, including the humerus, ulna, femur and tibia were unlike those of *C. stuhlmanni*. Bronner (pers. comm.) concurred with the identification of the specimen as *C. leucorhinus* based on the photographs of the recently dead animal. The basal width of the third claw, where it emerges from the skin, is 2.60 mm, which falls within the range recorded for *C. leucorhinus* (2.5-3.0 mm) and which is outside the range recorded for *Chrysochloris stuhlmanni* (Bronner, pers. comm.).

Figure 1: A Congo golden mole, *Calcochloris leucorhinus*, caught by a domestic cat in Batéké National Park, Gabon.

The nearest site to the Batéké Plateau where *C. leucorhinus* is known to occur is about 350 kilometres to the north, in Odzala National Park, in the west of the Republic of Congo (Carpaneto 1994, Christy 1999, Colyn and Perpete 1995). This species has already been collected from coastal Gabon in the equatorial forests of the Gamba complex, four hundred kilometres to the west of Batéké (Ward *et al.* 2004). It also occurs in Angola, Cameroon, the Central African Republic, the Democratic Republic of Congo and the Republic of Congo (Bronner 2008). The IUCN Red Data list cites the species' preferred habitat as lowland and montane equatorial forests (Bronner 2008), but this specimen was captured in savanna woodland. The southern part of Odzala National Park is a mosaic of forest and savanna, thus indicating that this species is also able to live in drier habitats than previously supposed.

The specimen is registered in the collections of the National Museums of Scotland as NMS.Z.2006.117. Currently the IUCN Red List categorizes this species as "Data deficient" (IUCN 2008). This record, one of the first golden mole sightings from Gabon, expands the geographical distribution of the species and extends its known range into woodland savanna habitat.

Acknowledgements

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We thank Paula Jenkins and Louise Tomsett for access to specimens in the Natural History Museum, London.

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Article:

Does the bush hyrax *Heterohyrax brucei* occur in North Africa?

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Introduction

The bush or yellow-spotted rock hyrax, *Heterohyrax brucei*, is mapped in recent publications as an occupant of North Africa, specifically in the Hoggar Mountains of south-eastern Algeria and along the Red Sea coast in Egypt (e.g. Kingdon 1997, Barry and Shoshani 2000, Shoshani 2005). Here, we briefly review the literature and classification of this species to clarify its distribution and question its inclusion in the North African mammal fauna.

Range assessment

Algeria

The supposed occurrence of the bush hyrax in Algeria appears to be based on the attribution of the form *antineae* (Heim de Balsac and Bégouen 1932) to this species. Kollmann (1912) described the first specimen of hyrax collected in the Hoggar Mountains of south-eastern Algeria as *Procavia bounhioli*. Subsequently, Heim de Balsac and Bégouen (1932) described *Procavia (Heterohyrax) antineae*, on the basis of five specimens (also from the Hoggar Mountains) distinguishing these two taxa by differences in colour and characters of the skull and teeth. Schwarz (1933) considered these two described forms conspecific, representing little more than colour phases of the same form, but Heim de Balsac (1934), having obtained an additional two specimens from the Hoggar, maintained his earlier assertion that the two taxa represent separate species.

Hahn (1935) undertook a detailed analysis of the Hyracoidea, including some 520 skins and 570 skulls from the Berlin Zoological Museum and 89 skins and 91 skulls from Tervuren Museum. Like Schwarz (1933), Hahn (1935) recognized the form *Procavia ruficeps bounhioli*, with *antineae* listed as a synonym. Hatt (1936) also considered the form *antineae* of doubtful validity, remarking "Heim de Balzac (sic) and Bégouen in the description of *Heterohyrax antineae* of the Hoggar Plateau, Central Sahara, noted two-well-marked colour phases, but mislead by an atypical combination of cranial characters they did not recognize that one of the colour phases of their supposedly new species was nothing more than the earlier known Hoggar species *Procavia bounhioli* Kollman, a slip which Schwarz soon discovered." Bothma (1971) suggested that the two colour phases described by Heim de Balsac and Bégouen (1932) accounted for the listing of *H. antineae* by Allen (1939) as a distinct form, while also recognizing *Procavia ruficeps bounhioli* with *antineae* as a synonym. Ellerman and Morrison-Scott (1951) included hyraxes from the Hoggar in *Procavia capensis*, with both *bounhioli* and *antineae* as synonyms.

More recent classifications tend to be somewhat equivocal on the matter of synonymy. Bothma (1971), for example, continued to list *bounhioli* as a subspecies of *Procavia ruficeps* but, like Allen (1939), recognized *Heterohyrax antineae* as distinct. Roche (1972) and Olds and Shoshani (1982) considered that both *bounhioli* and *antineae* represent synonyms of *P. c. ruficeps*. Schlitter (1993) retained *H. antineae* as a distinct species, listing *bounhioli* as a synonym of the monotypic *P. capensis*, but Barry and Shoshani (2000) listed *antineae* in synonymy with *Heterohyrax brucei* (although their map indicates a question mark above the putative range in Algeria) as did Shoshani (2005).

The single recent treatise focusing specifically on the mammalian fauna of Algeria (Kowalski and Rzebik-Kowalska 1991) considers that only a single species of hyrax, *Procavia capensis*, occurs in Algeria, with the forms *bounhioli* and *antineae* both synonyms. Likewise, neither Corbet (1978) nor Fischer (1992) lists any *Heterohyrax* species for North Africa. Furthermore, popular works, such as the photographic monograph of the Saharan fauna by Dragesco-Joffé (1993), and recent faunal surveys of the Hoggar mountains (e.g. Wacher *et al.* 2005), document only a single species of hyrax, *Procavia capensis*, for the region.

Egypt

How it is that *H. brucei* has been considered a part of the Egyptian fauna is unclear. Bothma (1971) listed the subspecies *H. b. brucei* from the Red Sea coastal mountains of Egypt, Sudan and Ethiopia, citing "Harrison, in litt. and Hayman, in litt.". Kingdon (1997) mapped the range as including the Red Sea coast, and Barry and Shoshani (2000) described the range of *H. brucei* as including Sinai and "along the [Egyptian] coast of the Red Sea". Yet, the species is not listed as occurring in Egypt by Hahn (1935), Ellerman and Morisson-Scott (1951), Roche (1972) or Corbet (1978). Furthermore, Osborn and Helmy (1980) in their comprehensive work on the extant mammal fauna of Egypt record only *P. capensis* in Egypt, with subspecies *P. c. syriaca* in the Sinai Peninsula and *P. c. ruficeps* in the eastern desert. Our review of the literature revealed no confirmed records of *H. brucei* from Egypt.

Perhaps of some nomenclatural interest is the proposal by Hahn (1935) that *Heterohyrax brucei* be called *Heterohyrax syriacus*. Schreber (1792) described the species *Hyrax syriacus*, from Lebanon, Sinai and "Abyssinia", based on a description and illustration by Bruce (1790). More than half a century later, Gray (1868) concluded that Schreber had actually described the bush hyrax (i.e. *Heterohyrax*) from northern Abyssinia, having never seen the hyrax living in Syria. Gray gave the Abyssinian form the name *Hyrax brucei* and named the Syrian form *Hyrax sinaiticus* (however, see Thomas 1892). This led Hahn (1935) to suggest that *Heterohyrax brucei* be called *Heterohyrax syriacus*, based on seniority. However, this name has not been adopted in any subsequent major classification of the hyraxes, and the name *syriacus* (and also *sinaiticus*) invariably is retained as a form of *Procavia* (although Roche 1972 considered it a *nomen dubium*).

Conclusions

In summary, we believe that, unlike elsewhere in Africa, *P. capensis* and *H. brucei* are not sympatric in the Hoggar Mountains and that there is no evidence to support the presence of *H. brucei* in Egypt, or anywhere north of northern Eritrea and Sudan. Final resolution on the northern boundaries of the range of this taxon will likely require additional field work, photographic documentation and perhaps the collection of additional specimens and/or tissue for genetic analysis.

Acknowledgements

We are grateful to Ron Barry for reviewing this manuscript and for his constructive edits and input.

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Article:

Tales of sengi tails

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In 2000, my wife Lynn and I were in Namibia researching the social organization of *Elephantulus intufi* (Rathbun and Rathbun 2006). During a meal at our study site which we shared with the landowner, his two sons and two archaeologists studying local rock art, the archaeologists showed us a newly published book (Lewis-Williams 2000). When Justin Holloway, the youngest son of the landowner, saw the cover photograph of a rock engraving he exclaimed "Hey look, an elephant-shrew". When I saw the cover, it was obvious that Justin was right. I contacted Craig Foster, the photographer, who put me in touch with Janette Deacon, who was studying the site where the photograph was taken. Janette believed the engraving represented a composite of different animals, including the head of a shrew and the legs of an elephant. After several e-mail exchanges, we agreed that the engraving was a reasonably accurate depiction of an elephant-shrew or sengi. The site is well within the known distribution of a couple of species of *Elephantulus*, which I assumed were the models for the images. To our knowledge, this is the only known rock art of sengis.

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Figure 1: The four-toed sengi, *Petrodromus tetradactylus sultan*, from coastal Kenya (Photo G. Rathbun).

Conservation efforts rely on biologists with intimate knowledge of where species occur and the traits used in their identification. One of the important features used in distinguishing some forms of sengi are the characteristics of their tails. For example, Corbet and Hanks (1968) in their definitive revision of the Macroscelidea, used the colour of giant sengi (*Rhynchocyon*) tails to distinguish several forms. The tail skin of the black-and-rufous sengi (*R. petersi*) is rufous or orange, while the tail of the subspecies of the chequered sengi that is isolated in the Congo Basin (*R. cirnei stuhlmanni*) is white. All other forms of *Rhynchocyon* have tails that are shades of brown to black, with a variable terminal white band that is about 3 cm long.

Many of the 10 species of *Elephantulus* are difficult to distinguish, but some of the most cryptic forms can be identified by the ratio of the tail to head-and-body length (Corbet and Hanks 1968). For example, in southwestern

Africa, the tail of the western rock sengi (*E. rupestris*) is proportionally longer than that of the bushveld sengi (*E. intufi*).

Perhaps the most bizarre (and unique) tail feature used in the taxonomy of sengis is the presence or absence and structure of the bristles along the bottom of the tail on some subspecies of the four-toed sengi (*Petrodromus tetradactylus*; Fig. 1). In *P. t. tetradactylus* from Malawi, Zimbabwe, Zambia and Tanzania the bristles are well-developed with either simple or club-shaped tips (Fig. 2). The bristles on *P. t. sultan* from coastal Kenya are the most specialised, with knobs on the tips. The tails of *P. t. warreni* from coastal forests of northwestern South Africa, however, lack bristles altogether.

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Figure 2: Details of tail bristles (ca. 7 mm long) on *Petrodromus tetradactylus tetradactylus* from Tanzania, showing clubbed tips.

In August 2001, Janette, Craig, Lynn and I met at the engraving site on a private farm in the Northern Cape Province of South Africa. The area is part of the vast Karoo bushveld, but the site is unique because of numerous scattered black boulders (Fig. 3), many with engravings of humans, ostriches, elephants and various species of antelopes. Only a pair of boulders, however, included images of sengis. Janette showed me the two boulders and upon close examination of the extraordinary sengi images (Fig. 4) I was shocked: each of the five engravings included the unmistakable tails of *Petrodromus* (Fig. 5).

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Figure 3: Sengi engravings are on these large black boulders located in the Karoo bushland in Northern Cape Province, South Africa.

Speculation on the function of *Petrodromus* tail bristles has an interesting history, which is reviewed in Jennings and Rathbun (2001). The first hypothesis was that the clubs and knobs were the result of singeing from bush fires. Then Corbet and Neal (1965) suggested that the bristles were used to detect ground vibrations, presumably including those produced by conspecific foot drumming. In the early 1970s, colleagues speculated that the bristles might be used as brushes to build and maintain the meticulous paths through the leaf litter that are characteristic of *Petrodromus*, but I suspected that the bristles were related to scent marking. I provided some preserved tail tissue to a Russian colleague, who documented that each bristle was associated with large sweat and sebaceous glands (Sokolov *et al.* 1980). The scent-marking hypothesis was further supported when I observed horizontal tail-lashing on the substrate associated with aggressive encounters between pairs of captive animals.

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Figure 4: Sengi engravings on boulders in the Karoo bushland.

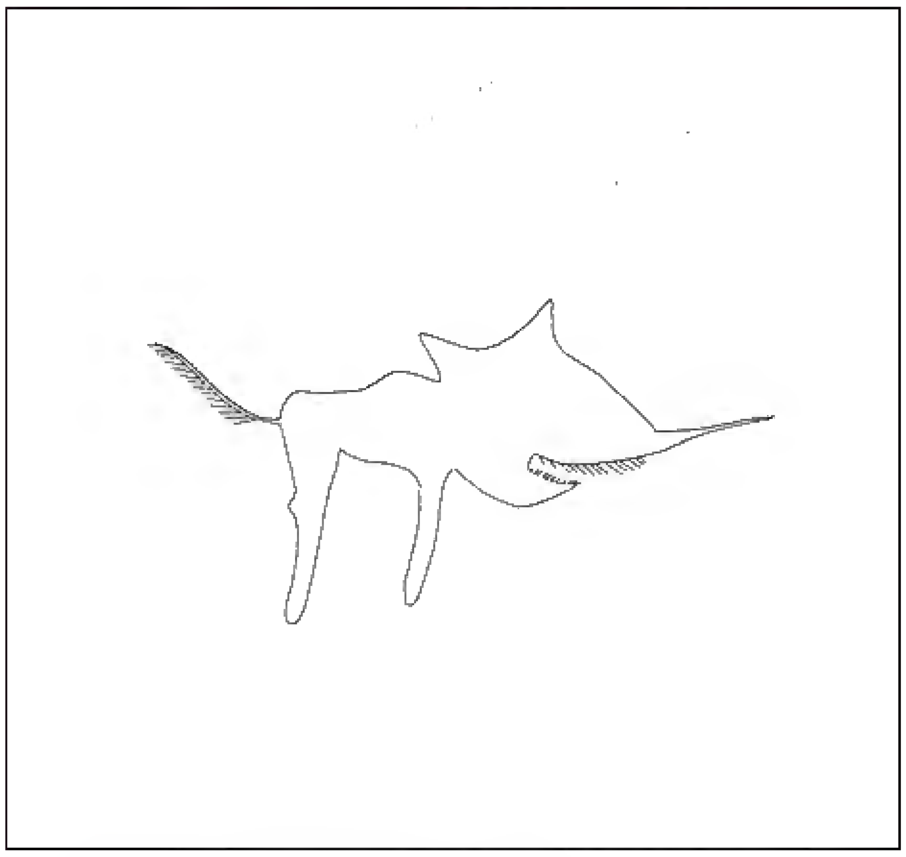

Figure 5: Paper tracing by Janette Deacon of one of the sengi engravings, showing tail bristles.

The sengi rock engravings raise several questions. Although *Petrodromus* was apparently well known to the unknown artist and must have enjoyed enough significance to be published (and thus preserved) in stone, why are the engravings of *Petrodromus* so far from "home"? There is no suitable habitat for *Petrodromus* anywhere nearby. Indeed, the closest population is about 1000 km to the east on the forested northern coast of KwaZulu-Natal, ***but*** the animals have no tail bristles there. The closest population with bristles is about 1200 km to the north in Zambia and Zimbabwe. Could the artist have travelled extensively in southern Africa, or do the engravings indicate that the distribution of *Petrodromus* has dramatically retracted since the engravings were made?

Perhaps more importantly, are the animals depicted really four-toed sengis? Janette (Deacon & Foster 2005) believes that the artist deliberately combined features of elephants (legs) and sengis (head and tail), along with adjacent engravings on one of the boulders of people dancing while carrying the tails of other animals. Like numerous images in the rock art of the San peoples of southern Africa, the sengi engravings may not depict reality. They are part of a religious art tradition, dating back 6000 years, that records the visions experienced by *!gi:ten* or medicine people when communicating with the spirit world.

So, are the engravings fanciful imaginations or reality, and if the latter might they have some biological or conservation significance? We may never know.

Acknowledgements

I am grateful for insights and comments provided by Janette Deacon for this account.

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Afrotheria News

New study investigates the impacts of human activities on the density and distribution of sengis in Yoko Forest Reserve, DRC

Little is know of the Macroscelidea in the Democratic Republic of Congo (DRC). Four sengi species have been recorded in DRC yet their status and distribution are poorly understood. Forest managers know little of how much forest use impacts sengis and to what extent sengis are exploited by local people for subsistence hunting.

Building on my DEA studies (see *Abstracts*) I am conducting my doctoral research in Yoko Forest Reserve in Kisangani Region of northern DRC. For this research, four grids or quadrants of four hectares each were set up respectively in primary forest dominated by *Gilbertiondendron dewevrei*, mixed primary forest, secondary forest and in old fallows. Traps were placed every 20m in the grids placed in the different habitats. The timing for the trapping is of 21 days per grid, per season and during a period of two years. Each site in the different habitats is being described. The evolution of the capture per site and per season will be analysed; the different human activities are also being noted and examined. A survey by questionnaire was submitted to the inhabitants of different local villages on the hunting of Mascroscelidea. Expected results are: an understanding of the density, the distribution, and the dynamics of the Mascroscelidea population and its habitat; an assessment of human impacts on sengis and their habitats.

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Afrotheria Noticeboard

Request for information on captive populations of streaked tenrecs

Few institutions have been successful in keeping the highland streaked tenrec (*Hemicentetes nigriceps*) in captivity. The reasons for the species failure to thrive are poorly understood.

Endangered Madagascar is a captive breeding facility for Malagasy wildlife in Bath, England. We currently keep four tenrec genera (*Setifer, Tenrec, Echinops* and *Hemicentetes*). According to ISIS, our breeding colony of *Hemicentetes nigriceps* is the only one in captivity.

We would like to hear from anyone with experience of keeping this species in captivity or fieldworkers who have pathology expertise.

Please contact:
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Abstracts

This section presents abstracts from recent papers on the Afrotheria.

A new species of subfossil shrew tenrec from Madagascar

Goodman, S.M., Vasey, N. and Burney, D.A. 2007. Description of a new species of subfossil shrew tenrec (Afrosoricida: Tenrecidae: *Microgale*) from cave deposits in southeastern Madagascar. *Proceedings of the Biological Society of Washington*, 120(4): 367–376.

A new species of shrew tenrec, Microgale macpheei, is described from subfossil deposits in Andrahomana Cave, extreme southeastern Madagascar. This species is distinguished from all named taxa of Microgale by a variety of osteological, dental, and mensural characters. It is presumed to be the sister taxon to the extant species M. brevicaudata, which is not known to occur in southeastern Madagascar. Although the genus contains well over 20 living species, M. macpheei is the first known extinct shrew tenrec in the Quaternary fauna of Madagascar.

The ecology and morphology of sengis in DRC

The paragraphs below are a summary (in French and English) of a Masters thesis undertaken on the Macroscelidea in the Democratic Republic of Congo.

Kaswera, K. 2007. *Aperçu sur l'écologie, la morphométrie et la structure des populations des Macroscélidés de la région de Kisangani.* Mémoire DEA inédit, Fac. Sci. UNIKIS, RDC.

La présente étude a été initiée dans le but d'approfondir la connaissance de la biologie et l'écologie des Macroscélidés de la région de Kisangani.

Les méthodes utilisées pour atteindre l'objectif fixé sont l'observation sur terrain, le piégeage en ligne, l'analyse des données morphométriques, l'analyse des organes reproducteurs, la description des sites de capture et la fouille des nids et terriers, la comparaison des données issues de différents habitats.

Vingt neuf *Petrodromus tetradactylus* PETERS, 1846 et 22 *Rhynchocyon cirnei stuhlmanni* MATSCHIE, 1893 ont été capturés dans quatre localités situées de part et d'autre du fleuve Congo qui se présenterait comme une véritable barrière naturelle pour ces bêtes. Par contre, les rivières Tshopo et Yoko ne s'avèrent pas être des barrières naturelles. Les analyses des données morphométriques ont prouvé que les populations situées de part et d'autre d'elles seraient identiques.

Concernant la structure des populations, le sexe ratio est autour de l'unité, il n'y a pas prédominance des mâles par rapport aux femelles pour les deux espèces.

La classe d'âge a été catégorisée en trois: les jeunes, les sub-adultes et les adultes.

Le taux de reproduction pour les femelles de *Petrodromus tetradactylus* serait de 72,7% et de 73,3% pour les mâles. Pour *Rhynchocyon cirnei stuhlmanni* le taux de reproduction chez les femelles est de 60% et 80% chez les mâles.

L'analyse saisonnière de l'évolution de la reproduction a montré que la fréquence des femelles gestantes serait proportionnelle à celle de l'ensemble des femelles. Chez *Petrodromus tetradactylus* la courbe met en évidence la présence d'un pic culminant durant la saison des fortes précipitations. Tandis que pour *Rhynchocyon cirnei stuhlmanni*, le pic se présente durant la saison subsèche.

L'étude écologique a mis en relief les habitats privilégiés par chaque espèce. En effet, *Petrodromus* manifeste des préférences pour des jachères vieilles. Il s'agirait spécialement des groupements de Marantacées, de fougères, de parasoliers, d'arbres à chenilles, de termitières et sur les berges des cours d'eaux. Ils se logent dans des terriers soutenus par des racines d'arbres. Par contre, *Rhynchocyon* préfère des forêts secondaires vieilles avec un sous bois plus ou moins claires. De façon particulière, des trouées avec des Marantacées, des monticules des termitières, des arbres fruitiers et des arbres à chenilles. Ils se logent dans des nids battis avec des feuilles ramassés dans les environs les plus proches.

Title in English: Overview of the ecology, morphometry and structure of Macroscelidea populations in the region of Kisangani.

The current study was undertaken with the aim of increasing knowledge on the biology and the ecology of the Macroscelidea in the region of Kisangani (Democratic Republic of Congo).

The following methods were used: field observation, trappings, analysis of morphometric data, analysis of reproductive organs, description of capture sites, searches in nests and burrows, and comparison of data from different habitats.

Twenty nine *Petrodromus tetradactylus* PETERS, 1846 and 22 *Rhynchocyon cirnei stuhlmanni* MATSCHIE, 1893 were captured in four localities situated on either side of the Congo river which appears as a natural barrier for these creatures. On the other hand the rivers Tshopo and Yoko do not seem to act as barriers. The morphometric data analysis has shown that the populations on either side of these rivers appear to be identical.

Concerning the structure of the populations, the sex ratio is approximately 1:1; males do not appear to dominate in numbers in both species.

The age class was divided in three: young, sub-adults and adults.

The reproductive rate for female *Petrodromus tetradactylus* appears to be 72.7% and 73.3% for the males. For *Rhynchocyon cirnei stuhlmanni* the reproductive rate is of 60% for females and 80% for males.

A seasonal analysis of reproduction evolution has shown that the frequency of gestating females appears to be proportional to the total number of females. In *Petrodromus tetradactylus* the graph shows a peak culminating during the rainy season. As to *Rhynchocyon cirnei stuhlmanni*, the peak appears during the sub-dry period.

The ecological study has shown the preferred habitat for each species. *Petrodromus* prefer old fallows, especially areas of Marantaceae, ferns, umbrella trees, Sapele trees, termites' nests and river banks. They live in burrows held together by tree roots. On the other hand, *Rhynchocyon* prefer old secondary forests with limited undergrowth, more specifically openings with Marantaceae, termites' nests, fruit trees and Sapele trees. They live in nests made up of leaves they collect in the neighbourhood.

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Some Recent Publications on the Afrotheria

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IUCN/SSC Afrotheria Specialist Group: Membership Data (October 2008)

Note: membership of IUCN Specialist Groups was officially dissolved at the IUCN Congress; it will be reconstituted in early 2009.

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